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(54) **VESSEL FOR RARE GAS FILLING, AND METHOD FOR POLARIZATION OF RARE GAS ATOMIC NUCLEUS USING SAID VESSEL**

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G01V 3/00 (2006.01)

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(58) **Field of Classification Search** 324/305, 324/304

See application file for complete search history.

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(57) **ABSTRACT**

A vessel for rare-gas filling is provided that is capable of realizing a substantially completely circularly polarized light state in the vessel by using a single crystal material for a light entrance window. To this end, the thickness and the crystal axis orientation of the single crystal material are optimized. A polarization method of rare-gas nucleus using such a vessel is also provided. Embodiment of the vessel and the polarization method include those in which (1) an alkali resistance is high, (2) a pressure resistance is high, (3) no permeation of 3He occurs, and (4) a neutron absorption corresponds to applications to basic science, for example, neutron scattering is negligible. The vessel for rare-gas filling includes a vessel body and a pipe connected to the vessel body for introducing a rare-gas containing gas and an alkali metal into the vessel body. The vessel body is provided with a light entrance window made of a single-crystal material of which the thickness and crystal axis orientation have been adjusted to be a predetermined thickness and orientation, respectively. The vessel for rare-gas filling is preferably formed of sapphire or the like.

10 Claims, 2 Drawing Sheets